

REMARKS

102 Rejection of Claims 1–6, 13, 15, 16, 21, 23–27, 34, 36, 37, 42 and 44

Independent claims 1, 21, 42 and 44 each require storing in a database record: (1) a first field identifying a class of equipment; (2) a second field identifying an attribute whose value is outputted by the class of equipment identified by the first field; and (3) a third field specifying an ID which the class of equipment identified by the first field assigns to the attribute value identified by the second field.

The claimed invention is a database method and apparatus for storing the information required to retrieve “attribute values” from a class of equipment (UUT) that is capable of outputting such attribute values. The database can be used by a diagnostic instrument to analyze such UUT. Specifically, the “second field” in claim 1 indicates what attributes can be outputted by a given class of equipment (UUT), and the “third field” in claim 1 indicates the respective ID assigned by the equipment (UUT) to each respective attribute.

An important feature of the claimed invention is that the ID stored in the third field is an ID assigned by the equipment (UUT) that *outputs* the attribute specified by the ID, rather than an ID assigned by a diagnostic apparatus *receiving* the attribute values from the UUT. The claimed invention enables a diagnostic instrument to look up the ID corresponding to a desired attribute of a desired class of UUT. The ID enables the diagnostic instrument to retrieve the attribute’s value from the UUT.

Claims 1–6, 13, 15, 16, 21, 23–27, 34, 36, 37, 42 and 44 were rejected under 35 USC 102(b) as anticipated by Chacon (US 6,128,588). The Examiner cites Chacon as disclosing an equipment ID, various process parameters, and a procedure ID, which the Examiner contends are the same as Applicant’s first, second and third fields, respectively. However, the Examiner’s interpretation of Chacon is erroneous for at least two reasons.

Firstly, Applicant disputes the Examiner’s interpretation of Chacon’s process parameters as being the same as Applicant’s second field. Chacon’s disclosure of process parameters is merely that the current values of process parameters are used to calculate time standards for performing each manufacturing step (col. 2, lines 24–29). Chacon fails to disclose storing an identification of any such process parameters in a database record. Therefore, Chacon fails to disclose storing a database record having a first field identifying a class of equipment and a second field identifying a process parameter or any other attribute outputted by the equipment identified in the first field.

Secondly, Applicant disputes the Examiner’s interpretation of Chacon’s procedure ID as being

the same as the attribute ID stored in Applicant's third field. Chacon's procedure ID does not identify an attribute outputted by the equipment identified by the equipment ID field. Instead, Chacon defines his procedure ID field as identifying an auto-scheduler (AS) route (col. 18, lines 3, 29–31 & 37–38). In other words, Chacon's procedure ID specifies a sequence of equipments between which a workpiece is routed for successive manufacturing steps. *A route or a sequence of equipments is not an "attribute" of an equipment.* Therefore, Chacon fails to disclose storing an ID of an attribute outputted by the equipment specified in the equipment ID field, wherein the ID is assigned by the equipment that outputs the attribute.

In summary, independent claims 1, 21, 42 and 44 are neither anticipated by nor obvious over Chacon because Chacon fails to disclose or suggest either: (1) a second field identifying an attribute whose value is outputted by the class of equipment identified by the first field; or (2) a third field specifying an ID which the class of equipment identified by the first field assigns to the attribute value identified by the second field. Therefore, claims 1, 21, 42 and 44 are patentable.

Dependent claims 2–6, 13, 15, 16, 23–27, 34, 36 and 37 are patentable because they are dependent on independent claim 1 or 21.

Claim 1: Additional Limitation

The preceding patentability argument applies to each of the independent claims 1, 21, 42 and 44 without regard to the present amendment to claim 1. However, claim 1 is amended to further distinguish from Chacon's procedure ID Applicant's attribute stored in the second field and Applicant's attribute ID stored in the third field. The amendment is supported in the specification at page 1, lines 16–19.

The amendment to claim 1 recites that the attribute identified in the second field, and whose ID is stored in the third field, "is a sensor measurement or operating parameter of said class of equipment identified by said first field". Chacon's procedure ID does not disclose or suggest an attribute ID as defined in Applicant's claim 1 because Chacon's procedure ID does not identify a measurement or operating parameter attribute outputted by an equipment identified in Chacon's equipment ID field. Specifically, Chacon's procedure ID specifies a route or sequence of equipments, which cannot be considered an operating parameter of an equipment as recited in claim 1. Therefore, claim 1 and dependent claims 2–6, 13, 15 and 16 are patentable.

Claims 2–4 and 23–25

Claims 2–4 and 23–25 are dependent on claims 1 and 21 and further recite that the ID stored in the third field *uniquely* specifies an attribute (claims 2 and 23) or *uniquely* specifies a command in response to which the equipment outputs the specified attribute (claims 3, 4, 24 and 25). Chacon lacks any disclosure of an ID that uniquely specifies an attribute outputted by an equipment. The only references in Chacon to *uniqueness* refer to equipment ID's, routing steps/stages, and time schedules (e.g., TACT records), none of which can be considered an attribute outputted by an equipment. Therefore, claims 2–4 and 23–25 are patentable.

Claims 5 and 26

Claims 5 and 26 are dependent on claims 1 and 21 and further recite a fourth database field that identifies the *position* of a chamber connected to the class of equipment specified in the first database field.

The claimed invention is useful when the class of equipment specified in the first database field is a “mainframe” or “platform” to which multiple manufacturing process chambers can be connected. Such a mainframe or platform typically assigns a differentiates among the chambers by assigning a unique position number or position ID to each chamber, and this position number or position ID typically is required in order for a diagnostic instrument to retrieve attribute values from one of the chambers.

Chacon lacks any disclosure of multiple chambers connected to an equipment. Therefore, Chacon fails to disclose or suggest providing a fourth database field that specifies the position of a chamber connected to an equipment specified by a first database field.

Claims 15–16 and 36–37

Claims 15–16 and 36–37 are amended to correct an erroneous reference to the first field that should have been the second field. The correction makes these dependent claims consistent with independent claims 1 and 21, which define the second field as the field in which the identification of an attribute is stored.

Claims 15–16 and 36–37 are dependent on claims 1 and 21 and further recite that the attribute identified in the second field, and whose ID is stored in the third field, is “a measurement of a process performed in a semiconductor fabrication process chamber” (claims 15 and 36) or “an operating condition of a process performed in a semiconductor fabrication process chamber” (claims 16 and 37).

The Examiner bases the rejection of claims 15 and 36 on Chacon's disclosure of measuring the capacity and performance, such as lead time and wafer output, of a semiconductor factory (Chacon col. 1, lines 47–52). However, Chacon lacks any disclosure of storing an identification of such measurements in a field of a database record. Therefore, Chacon fails to disclose or suggest the claimed invention of storing an identification of such measurements in a second field of a database record, wherein the same database record also stores a first field that identifies the equipment that outputs such measurement and a third field that specifies an ID assigned to the measurement by the equipment identified in the first field.

The Examiner bases the rejection of claims 16 and 37 on Chacon's disclosure of entering process parameter values into a computer model for calculating time standards (Chacon col. 2, lines 18–20 and 26–29). However, Chacon lacks any disclosure of storing an identification of such process parameter in a field of a database record. Therefore, Chacon fails to disclose or suggest the claimed invention of storing an identification of a semiconductor fabrication process parameter in a second field of a database record, wherein the same database record also stores a first field that identifies the equipment that outputs the values of such process parameter and a third field that specifies an ID assigned to the process parameter by the equipment identified in the first field.

Accordingly, claims 15–16 and 36–37 are patentable.

Claims 7–10, 14, 28–31 and 35

Claims 7–10, 14, 28–31 and 35 were rejected under 35 USC 103 as unpatentable over Chacon in view of Beauchesne (US 5,777,876).

These dependent claims are patentable for the same reasons that independent claims 1 and 21 are patentable, as argued above. In particular, the Beauchesne reference fails to disclose storing a database field identifying an attribute outputted by an equipment. Therefore, Beauchesne fails to overcome the failure of the Chacon reference to disclose: (1) a second field identifying an attribute whose value is outputted by the class of equipment identified by the first field; and (2) a third field specifying an ID which the class of equipment identified by the first field assigns to the attribute value identified by the second field. Accordingly, claims 7–10, 14, 22, 28–31 and 35 are patentable over Chacon in view of Beauchesne.

In addition to the limitations of independent claims 1 and 21, dependent claims 7–10, 14, 28–31 and 35 further recite that the first field identifies a version of equipment. The Examiner admits this feature is not disclosed in Chacon, but contends it is obvious based on the disclosure in

Beauchesne of a database field that identifies a version of the product being manufactured by the equipment.

Applicant disputes the Examiner's position that Beauchesne's storing the version of a product suggests modifying Chacon's database to store in the version of the equipment. The Examiner's position overlooks the fact that the first, second and third database fields required by the claimed invention are interrelated parts of a single database record, not independent entities. Specifically, the first and second fields are interrelated because the attribute identified in the second field of a database record is an attribute outputted by the equipment identified in the first field of the same record. Likewise, the third field is interrelated with the first and second fields because the attribute ID specified in the third field of a record is assigned to the attribute identified in the second field of the same record by the equipment identified in the first field of that record.

An advantage of Applicant's invention is that Applicant's database can store different ID's that different versions of an equipment assign to an attribute, thereby enabling a diagnostic instrument to retrieve attribute data from different versions of the equipment. This utility is based on the specified relationship between the first, second and third fields of each database record.

Beauchesne stores the version of a product being manufactured, not the version of an equipment that outputs any attribute values. Beauchesne's disclosed product does not output anything, at least not during the manufacturing process in which Beauchesne's database is used. Accordingly, Beauchesne lacks any teaching that its stored product version has any relationship to any attribute value outputted by the product. Therefore, Beauchesne fails to suggest or motivate modifying Chacon's database to store the version of an equipment that outputs an attribute value so as to achieve the utility of the claimed invention, i.e., so as to enable the retrieval of attribute data from different versions of equipment.

Therefore, claims 7–10, 14, 28–31 and 35 are patentable over Chacon in view of Beauchesne.

Claims 9, 10, 30 and 31

Claims 9, 10, 30 and 31 are patentable because they include the limitations discussed in the immediately preceding section of these remarks.

In addition, claims 9, 10, 30 and 31 further recite first and second subordinate fields that collectively identify a range of versions of an equipment model. The Examiner based the rejection of these claims on Beauchesne's disclosure of a "revision field" and a "previous revision" field. However, Beauchesne's two discrete revisions do not constitute a "range" of versions as required by

the claimed invention. The “New Oxford American Dictionary, 2nd Edition” defines “range” as “the area of variation between upper and lower limits: *the cost is thought to be in the range of \$1–5 million.*” That is, a range is a continuum between two endpoints, not just two discrete values. Therefore, Beauchesne’s two discrete revisions do not constitute a “range” of versions as required by the claimed invention.

Accordingly, Beauchesne fails to suggest or motivate the invention, hence claims 9, 10, 30 and 31 are patentable over Chacon in view of Beauchesne.

Claims 11, 12, 32 and 33

Claims 11, 12, 32 and 33 were rejected under 35 USC 103 as unpatentable over Chacon in view of Beauchesne (US 5,777,876).

These dependent claims are patentable for the same reasons that independent claims 1 and 21 are patentable, as argued above. In particular, the Beauchesne reference fails to disclose storing a database field identifying an attribute outputted by an equipment. Therefore, Beauchesne fails to overcome the failure of the Chacon reference to disclose: (1) a second field identifying an attribute whose value is outputted by the class of equipment identified by the first field; and (2) a third field specifying an ID which the class of equipment identified by the first field assigns to the attribute value identified by the second field. Accordingly, claims 11, 12, 32 and 33 are patentable over Chacon in view of Beauchesne.

In addition to the limitations of independent claims 1 and 21, dependent claims 11, 12, 32 and 33 further recite first and second subordinate fields that collectively identify a range of revision dates of an equipment model. The Examiner based the rejection of these claims on Beauchesne’s disclosure of a “file date field” (col. 6, lines 12–19) and on Beauchesne’s Figure 2b allegedly disclosing time/date for different revisions.

Beauchesne’s “file date field” fails to suggest the claimed invention because it apparently represents the date of a file or of an update to a file, not the revision date of an equipment model.

Beauchesne’s Figure 2b discloses a “time/date” field in a “history table” that records the respective dates on which a manufacturing process changed its recipe (col. 8, lines 47–54). Changes in a process recipe have nothing to do with equipment revisions as in the claimed invention.

Therefore, Beauchesne fails to suggest or motivate the invention, hence claims 11, 12, 32 and 33 are patentable over Chacon in view of Beauchesne.

Claims 17–20, 38–41, 43 and 45

Claims 17–20, 38–41, 43 and 45 each require storing in a database record: (1) a first field identifying a class of equipment; (2) a second field identifying an attribute whose value is outputted by the class of equipment identified by the first field; and (3) a third field specifying a conversion parameter that defines a conversion of the value of the attribute identified in the second field into physical units of measurement.

The claimed invention is useful because various classes of equipment employ different schemes for representing physical attributes as numerical or electrical values outputted by the equipment. For example, two classes of equipment may both output a temperature measurement attribute as a binary number, but one class equipment may use two consecutive binary numbers to represent respective temperatures differing by one degree, whereas another class of equipment may use the same two numbers to represent temperatures differing by five degrees. The invention enables a diagnostic instrument to retrieve the value of a physical attribute from various such equipments by specifying at least one conversion parameter that defines a conversion from the value outputted by the equipment to physical units of measurement.

Claims 17–20, 38–41, 43 and 45 were rejected under 35 USC 103 as unpatentable over Chacon in view of Martorana (US 2003/0236628). The Examiner admitted that Chacon fails to disclose the third field of the claimed invention, but contended that this was disclosed by Martorana.

However, Martorana lacks any disclosure of storing in a database a conversion parameter that defines a conversion into physical units of measurement. The passages of Martorana cited by the Examiner merely disclose measuring temperature without disclosing anything regarding a conversion into physical units of measurement, much less storing such a conversion parameter in a database.

Martorana's paragraphs [0008] and [0014] use the term “inertial measurement unit”, but the term “unit” is used to mean “apparatus”, not a unit of measurement. Specifically, the “inertial measurement unit” is disclosed as an apparatus having a gyroscope and an accelerometer (paragraph [0015], second sentence).

Because Martorana lacks any disclosure of storing in a database a conversion parameter that defines a conversion into physical units of measurement, claims 17–20, 38–41, 43 and 45 are patentable over Chacon in view of Martorana.

Claims 46–50

Newly added claims 46–50 are dependent on claim 1, so they are patentable for the same

reasons that claim 1 is patentable as argued above.

In addition to the limitations of claim 1, dependent claims 46–50 further distinguish the Chacon prior art by reciting additional steps of retrieving one of the attribute data records and using the ID from the third field of the attribute data record to retrieve a value of the first attribute from the manufacturing equipment. This is supported in the flow chart shown in Figure 6 and described in the specification at page 17, line 24 through page 19, line 26 and at page 14, lines 6–25.

Claim 47 more specifically recites that the third field identifies a command, and additionally recites the step of sending said command to the manufacturing equipment. The equipment responds to this command by outputting a value of the first attribute. This is supported in the specification at page 14, lines 18–21 and page 19, lines 13–14.

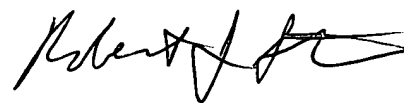
Claim 48 more specifically recites that the third field identifies a signal line, and additionally recites the step of receiving the first attribute from said signal line. This is supported in the specification at page 14, lines 15–17 and page 19, lines 17–21.

Claim 49 more specifically recites that the third field identifies a first ID that identifies a first address transmitted by the manufacturing equipment when it transmits the first attribute, and additionally recites the step of using the first ID to locate a value of the first attribute within the attribute data. This is supported in the specification at page 14, lines 22–24 and page 19, lines 15–17.

Claim 50 more specifically recites that the third field identifies a first ID that identifies a first offset that specifies a position of the first attribute within a frame of data transmitted by the first manufacturing equipment, and additionally recites the step of using the first offset to locate a value of the first attribute within the attribute data. This is supported in the specification at page 14, lines 22–25 and page 19, lines 15–17.

Chacon lacks any disclosure or suggestion of using an ID stored in a database record to retrieve a desired attribute from a manufacturing equipment. Therefore, claims 46–50 are patentable over Chacon.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Robert J. Stern", with a stylized flourish at the end.

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